3D Motion Controller User's Manual

3DxWare

Windows 98, Me, NT, 2000, XP

WWW.3DCONNEXION.COM

3Dconnexion
A LOGITECH COMPANY

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NOTE: For optimal viewing of this document, it is recommended to use the latest version of Adobe Acrobat Reader, available on the 3DxWare driver CD-ROM or at www.adobe.com/acrobat.

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Introduction to Motion Controllers

Congratulations on your purchase of a 3Dconnexion motion controller. This document describes 3Dconnexion's series of innovative motion controllers, designed for moving objects or navigating viewpoint in the virtual space.

Two Hands for Intuitive Control

Welcome to the world of motion controllers. 3Dconnexion's motion controllers provide the "two hands are better than one" approach to navigating and editing 2D and 3D objects. The ability to navigate intuitively with one hand while editing with the other provides natural comfort, control and efficiency when generating and manipulating objects or viewpoints in a 2D or 3D application.

True 2D and 3D Input for Intuitive Control

A motion controller is a true three-dimensional input device that translates the slightest fingertip pressure into X, Y, and Z translations and rotations, moving 2D and 3D images instantaneously and simultaneously. This provides intuitive, interactive six degrees-of-freedom control of graphical models.

Flexible Software Interface

3DxWare, the motion controller's driver software, is a configuration utility for the device. Applications are supported by one of three methods:

- a plug-in for the application, requiring the installation of the complete driver software.
- a native integration within the application itself, requiring only that the standard driver be installed.
- no driver software when an application reads the serial port directly. The users of this kind of an application are not able to use the driver software since the serial port is "owned" already by the application.

World Class Technologies

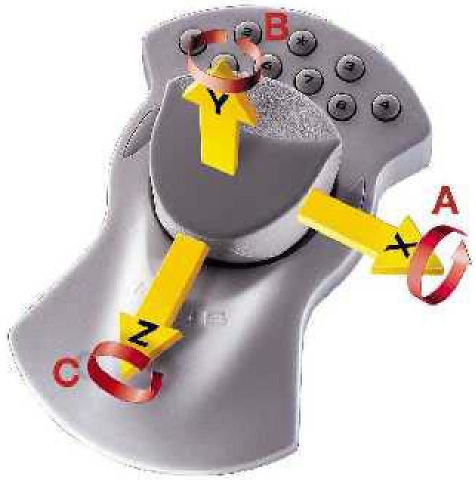
3Dconnexion produces several product lines, based on different technologies:

- ***SpaceBall***
- ***SpaceMouse***
- ***SpaceNavigator***
- ***CadMan***
- ***SpaceTraveler***

The different models within each product line represent our offering of motion controllers.

How the Motion Controllers Control Six Degrees of Freedom

Moving the onscreen object is as easy as moving the motion controller. As you open a supported 2D or 3D application, you will begin to feel the movement/reaction of your motion controller, and how the object or viewpoints shift and rotate. The device acts as an extension of your hand, with range of motion and onscreen reactions as simultaneous as moving a real object. Push the motion controller up and down, pull forward or away from you, or shift right and left to rotate, zoom, pan or perform any of the features supported by your 3Dconnexion device.



The values inputted by the motion controllers are not interpreted as absolute position commands but as "velocity" commands. When the device is manipulated by a constant amount or measurement, the object is assigned a continuous speed in the same direction (a velocity measurement). The magnitude or degree of the device’s movement determines the magnitude of the onscreen object’s velocity.

Installation

To install the motion controller device and 3DxWare driver software on systems running Microsoft® Windows® 98, Me, NT 4.0, 2000, XP or XP64, see the information below. For installation troubleshooting tips, see the appropriate section in Troubleshooting.

Note: SpaceNavigator is currently supported in Windows 2000 and Windows XP.

Hardware Installation

3Dconnexion, Inc.'s motion controllers are equipped with either a 9-pin female serial connector or a USB connector. Installation of each connection type is described below.

Serial Connection

Turn off the machine before connecting the motion controller. Plug the cable directly into the appropriate port (usually COM1 or COM2) at the back of the machine. Once the connection has been made, you can restore power to the machine.

USB Connection

Plug the cable directly into the appropriate port at the back of the machine. Do not insert the 3DxWare CD-ROM at this time. The Windows Hardware Assistant will automatically recognize the new device and begin the hardware installation program that is included in Windows. Follow the instructions onscreen. For most users, it is recommended to let the Hardware Assistant find the best driver for the device.

Software Installation

CD Auto-Install

Insert the 3DxWare CD into the CD-ROM drive. The installation will automatically start.

Install

Run Setup.exe from your CD-ROM drive.

From Website

Visit http://www.3dconnexion.com/software to download updated drivers.

Installed Folder

The installation creates a folder under the directory specified at the time of installation. The default directory is:
\Program Files\3Dconnexion\3DxWare

Supported Operating Systems

The 3DxWare driver is supported on the following operating systems:

- SpaceBall, SpaceMouse, and CadMan: PC with Windows 98, Me, NT 4.0, 2000, XP & XP64
- SpaceNavigator: PC with Windows XP or 2000

Application List & Driver Installation Instructions

Locate your application in the Application List and note the installation instructions. Then proceed to Driver Installation Procedure. A complete list of all supported applications and installation instructions for 3Dconnexion's motion controllers can be found on our website.

Visit www.3dconnexion.com/software/drivers for the most current information.

NOTE: If the list indicates that an appropriate driver is included with your application, you should consult the application manual for the appropriate motion controller installation procedure. If the list indicates a file to copy, there is no installation tool program for your application. Instead you must manually copy the specified file to your system.

Driver Installation Procedure

If an appropriate driver has not been included with your application, follow the instructions below. For help see Troubleshooting.

1. Insert the CD-ROM into your CD-ROM drive.
2. The installation program *Setup.exe* automatically begins (if auto-start is activated on your CD-ROM drive). Continue with this installation program only if *Run Setup.exe* is listed for your application. (If *Run Setup.exe* is not listed for your application, you should cancel the installation and follow the instructions given for your application. See Application List & Driver Installation Instructions.)
3. Select the plug-ins and choose the driver you wish to use with the motion controller. (For SpaceNavigator, choose the 3DxOffice plug-in for Microsoft Office application support.)
4. Follow the instructions onscreen. Make sure the destination folder is the one to which you want the driver to be copied.
5. After installation is complete, the 3DxWare driver starts automatically and the motion controller should respond with two beeps indicating that it is receiving power and working properly. The driver icon appears at the lower-right corner of the Windows Taskbar in the system tray.

   (Note: SpaceNavigator does not beep. Keyboard and controller response indicates that the SpaceNavigator is working properly.)

Startup Tips

In order to use a motion controller, you must start the driver each time you log on to the system. Alternatively, you can put the driver in the *Startup* folder, so that it starts automatically every time you log on. The driver installation and setup will give you the option of setting the driver to automatically start every time Windows starts.

The 3DxWare driver icon will appear in the Taskbar system tray if the driver has been initialized successfully.

Using Additional Applications

To install additional drivers for other applications, follow the instructions in the *Readme* files, which are located on the CD-ROM in subdirectories under the names of the appropriate applications.

Driver Uninstall Procedure

To uninstall the 3DxWare Driver, go to *Start > Control Panel > Add or Remove Programs.* The 3DxWare driver will be listed there, as well as any of the plug-ins you have installed.

Choose *Change/Remove* and follow the onscreen instructions for removing the driver or plug-in.

You do not need to perform an uninstall before installing a driver upgrade. The installer will automatically detect that you have a previous 3DxWare driver version already installed and ask you if you wish to uninstall. Indicating yes will uninstall the current version and proceed to install the newer version.

You may check for driver upgrades at www.3dconnexion.com/software.

3DxWare Driver

The 3DxWare driver establishes communication between the motion controller and application, searches and recognizes attached devices, and changes configuration files dependent on which application is in the active window.

Starting the Driver

The driver can be started in three ways:

- Automatic Start-up
- Windows Start Menu
- Console Command Line

Automatic Start-up

The driver will start automatically when a user logs in. This option must have been selected during installation. This will place a Shortcut to the driver in the All Users Startup folder.

Windows Start Menu

If you did not choose the automatic startup option, you can start the driver by launching *Start > Programs > 3Dconnexion > 3DxWare > Start Driver*.

Console Command Line

The driver can also be invoked at a command prompt from the directory installed (default is: C:/Program Files/3Dconnexion/3DxWare) by typing the following:

3DxSrv	Starts the driver
3DxSrv –quiet	Starts the driver without warnings or error messages
3DxSrv -shutdown	Closes all running drivers

System Tray Menu

To open the 3DxWare System Tray menu, right click on the icon in the system tray.

Help…	brings up online documentation
Open Window	opens or closes the 3Dconnexion control panel
Exit	shuts down the driver

3Dconnexion Control Panel

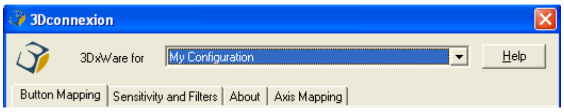
The 3Dconnexion control panel gives you the option to change settings on your motion controller. Control Panel settings can be modified by each user to create custom sensitivities and button mappings that satisfy your personal preferences.

Application Specific Configurations

Every supported application has a separate configuration file. The driver automatically switches to the configuration file for the application running or being edited in the active window. The "Any Application" file will load for applications that do not have a specific configuration file. Additionally, each file has unique button mappings for each device model. The driver automatically loads the settings for the attached motion controller.

Customize Your User Profile

You can create your own user profile for the device. If you made changes on the control panel and saved them to a custom configuration file by clicking on the Save button, the custom configuration file will be available to you in future application sessions, and the saved configuration name will be listed in the application window of the control panel.



3DxWare for My Configuration

Saved Configuration Files

The device configuration is saved in a file that is part of the driver software (*.scg). This file is a Windows platform specific file in ASCII text format. The configuration file is read by the driver software before opening the user interface, initializing it accordingly.

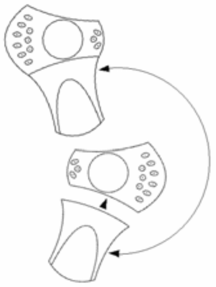
3DxWare Control Panel

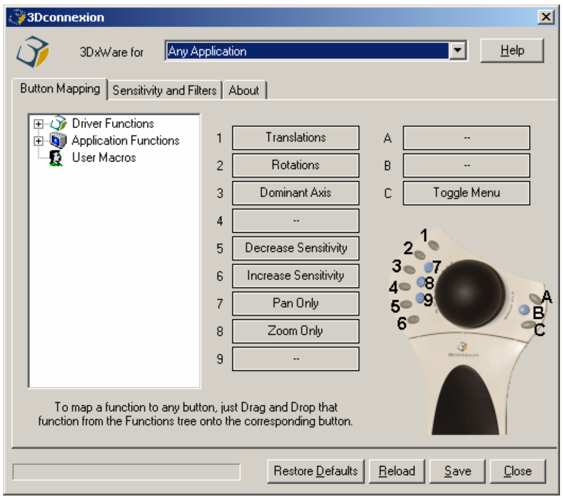
By accessing the 3Dconnexion control panel, you can customize the device button functions, adjust sensitivity, and change device properties to most suit your needs. The 3DxOffice plug-in also adds an axis mapping tab for mapping functions to a specific controller motion.

Model Specific Interface Views

The driver's control panel has a self-adjusting layout and will always visually reflect the physical appearance of the motion controller. An image of the detected device accompanies the correct button layout for the hardware.

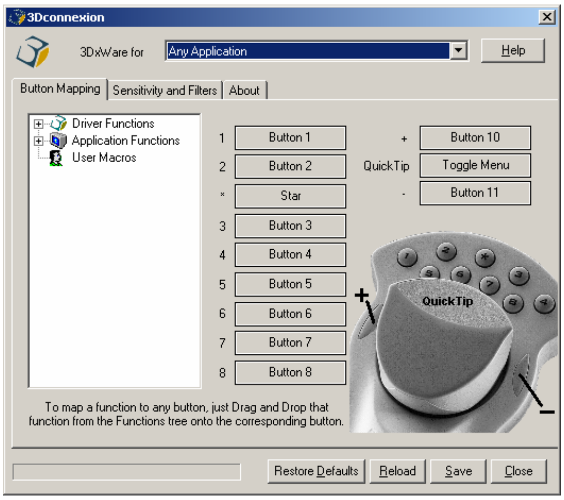
For example, the SpaceBall 4000 FLX has a left and right hand configuration, configurable by the orientation of the palm rest. The driver interface will adjust to reflect the device orientation.





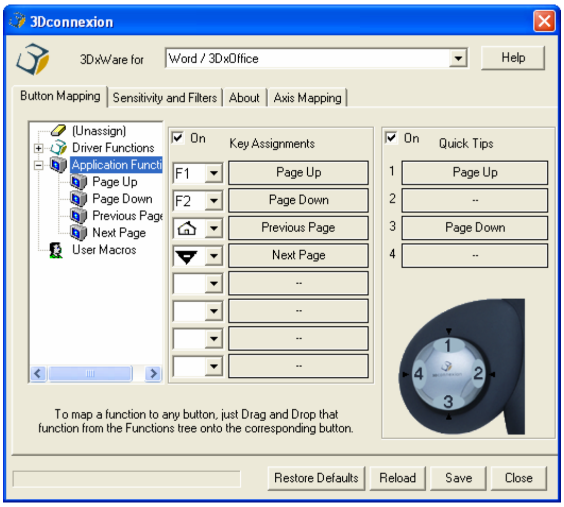
To map a function to any button, just Drag and Drop that function from the Functions tree onto the corresponding button.

This view shows the interface window of the left hand oriented SpaceBall.



To map a function to any button, just Drag and Drop that function from the Functions tree onto the corresponding button.

The SpaceMouse Plus/XT interface shows the supported buttons.



To map a function to any button, just Drag and Drop that function from the Functions tree onto the corresponding button.

This view shows the interface window of the SpaceNavigator.

Global Controls

This is a set of controls common to all tabs in the 3DxWare interface. These are located at the top and bottom of the panel.

Application List contains a list of configuration files for the currently loaded application. If more than one configuration is available for the current application, you can make your selection from the drop box list of available configurations.

Help loads the 3DxWare help file.

Status Bar displays the function description of the pressed button (for Button Mapping).

Restore Defaults reverts settings to their default state for the loaded application.

Reload reverts the settings to the last saved configuration.

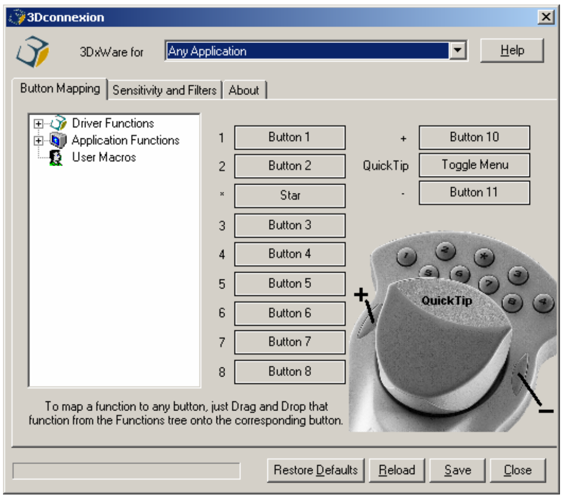
Save saves the current settings to a user specific configuration file.

Close closes the control panel.

Button Mapping Tab

Use this tab to change the functions mapped to any of the motion controller's buttons.

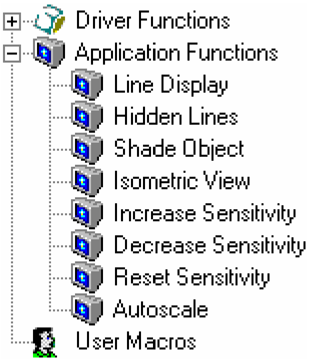
You must first open the application for which you wish to edit the button mapping configuration, and have the panel focused on the appropriate application in the "3DxWare For" pull down menu, as shown in the picture below.



3DxWare for: Any Application

To map a function to any button, just Drag and Drop that function from the Functions tree onto the corresponding button.

Function Tree contains a list of all the available button operations for the particular application. The functions are grouped by implementation: Driver Functions, Application Functions and User Macros. To expand the tree select (click) the + next to the entry.



Driver Functions are features that trigger responses within the driver itself. This includes functions such as Disable/Enable Translations, Increase Sensitivity, and Toggle Menu.

Application Functions are those for which the application must respond. Typical operations are Reset View, Zoom All, and Repaint.

User Macros allow a designer to generate custom functions by assigning a sequence of keyboard strokes to a function. Please see User Macro Editor for information on creating your own macro.

To assign a function to a motion controller button, select a command from the Function Tree and drag and drop it onto a button on the button list to the right. The description of the button will update to reflect the command change.

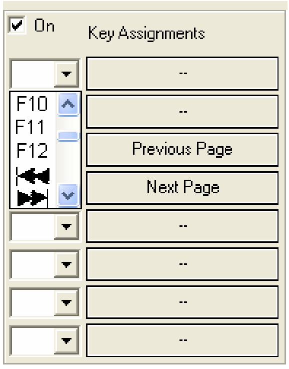
To clear a mapped button, right click on the function previously mapped to the button and choose Unassign, or you can map Unassign to the button by selecting Unassign from the Function Tree and dragging and dropping it to the button. Two dashes appear, indicating that the button is not assigned a function.

Buttons display the current function mappings.

Button Mapping Tab (SpaceNavigator)

For SpaceNavigator, button mapping configurations are available for the F1-F12 keys on the keyboard, as well as the function buttons on the upper tier of the keyboard, as shown in the picture below.

If you open the drop box to the left of Key Assignments, you can see all available keyboard keys for assigning functions and macros.

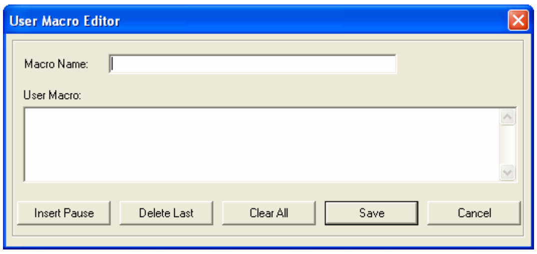


After mapping a function to a key, F-Lock on your keyboard may need to be on before you can execute that function. If you map a function to F1-F12, you must have F-Lock turned on to execute that mapped function. If you map directly to the images on the F1-F12 keys, available in the drop down menu in key mapping, you do not have to turn F-Lock on to execute that function.

When you press the F-Lock key on your keyboard, a green indicator above a circled "F," located at the top middle of your keyboard, will turn on and stay on until you turn F-Lock off.

User Macro Editor

Custom functions consist of recorded keyboard macros that can be played back within an application. To create your own function, right-click the *User Macros* entry in the function tree and select Add User Macro. Selecting Add User Macro will display the User Macro Editor – the interface that creates the user macros.



Macro Name is the edit box for entering the name of the keyboard function. This name will be displayed in the Function Tree for assignment.

User Macro displays the keyboard sequence as it is entered. Using your keyboard, enter the command sequence for the macro you are adding.

The following commands are not accepted in a Custom Function: Ctrl Alt Del, Ctrl Esc, Alt Esc, Ctrl Break, and Alt Tab.

Insert Pause will add a ½ sec time delay between key presses when the custom function is used. A pause is displayed as {Wait} in the Custom Function window. This is useful in some applications when interacting with the toolbar.

Delete Last removes the most recent keyboard entry. Note that pressing the backspace or delete key on the keyboard will not delete an inserted command. Pressing backspace or delete key will insert those key presses into the User Macro.

Clear All erases all the key presses entered for the function.

Save stores the custom macro for use in the Button Mapping Window.

Note: The macro will not be saved to the configuration file until the user saves the current setup through the Global Controls interface.

Cancel exits the Custom Function Editor without saving the keyboard macro.

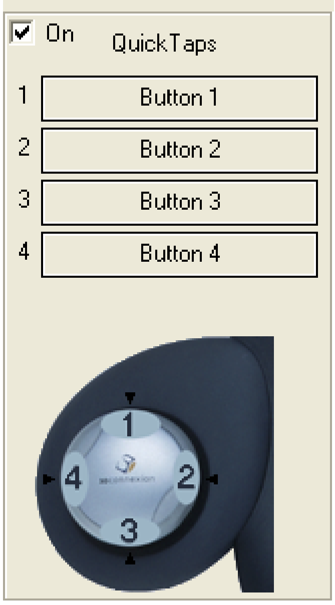
QuickTaps™
(SpaceMouse and CadMan)

QuickTaps are executed by pressing downward on the handle of the SpaceMouse or CadMan with a quick tipping motion of your finger. The QuickTaps function is a "virtual" button that may be programmed just like the normal hardware buttons. The default function assigned to QuickTaps toggles the driver window. Note that for the SpaceMouse Classic and some of the early models of SpaceMouse Plus, the translation and rotation must be turned ON and the dominant mode turned OFF for the QuickTaps function to work.

QuickTaps
(SpaceNavigator)

SpaceNavigator allows you to map up to four QuickTaps which are executed by pressing at the top, bottom, left and right of the motion controller, as indicated on the directional arrows located directly under the motion controller on the keyboard.

When you install your 3DxWare driver for SpaceNavigator, QuickTaps defaults to the off position. You may turn QuickTaps on by checking the On box next to QuickTaps located in the Button Mapping tab.



☑ On QuickTaps

1 Button 1

2 Button 2

3 Button 3

4 Button 4

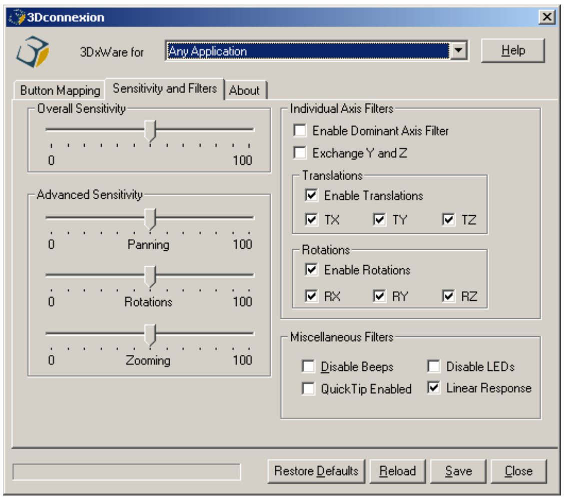
Follow the same instructions for mapping functions to QuickTaps as you would for button mapping. Select a command from the Function Tree and drag and drop it onto a button on the QuickTaps list. The description of the button will update to reflect the command change.

You will observe the location of Buttons 1 through 4 in the above picture for using QuickTaps. Tap on the appropriate area on the controller for the desired mapped function.

To clear a mapped QuickTap, right click on the function previously mapped to the button and choose Unassign.

Sensitivity and Filters Tab

This tab gives access to controls that allow you to customize the behavior of the motion controller and driver in 3D applications. For office applications, there is no need to change these settings.



3DxWare for: Any Application

Individual Axis Filters

☐ Enable Dominant Axis Filter

☐ Exchange Y and Z

Translations: ☑ Enable Translations ☑ TX ☑ TY ☑ TZ

Rotations: ☑ Enable Rotations ☑ RX ☑ RY ☑ RZ

Miscellaneous Filters

☐ Disable Beeps ☐ Disable LEDs

☐ QuickTip Enabled ☑ Linear Response

Overall Sensitivity controls a scalar value that is applied to all motion data before it is sent to an application, effectively changing the amount of force or torque that needs to be applied to the controller to move a model or scene. The slider starts in the middle and has six positions to the left and right of its starting position. Each position to the right increases the sensitivity. Each position to the left decreases the sensitivity.

Advanced Sensitivity Sliders allow for greater fine-tuning of the motion behavior. Each set of motion operations can be individually configured to meet your preference.

- *Panning* controls the sensitivity for the translations (force) along the X and Y axes.
- *Rotations* controls the sensitivity for all three rotation (torque) axes: Rx, Ry and Rz.
- *Zooming* controls the translation sensitivity along the Z axis.

Enable Dominant Axis, if enabled, restricts rotations and translations along or around the single most dominant axis.

Exchange Y and Z swaps the translations of the Y and Z axes. This places the X and Y axis in the same plane as your desktop instead of the monitor screen.

Enable Translations toggles the translation filters applied to the controller motion data. When enabled, all three translations (TX, TY and TZ) are passed on to the application. If this checkbox is disabled, none of the translation data is passed to the application.

The TX, TY, and TZ checkboxes allow each axis to be individually customized.

Enable Rotations toggles the rotation filters applied to the controller motion data. When enabled, all three rotations (RX, RY and RZ) are passed on to the application. If this checkbox is disabled, none of the rotation data are passed to the application.

The RX, RY, and RZ checkboxes allow each axis to be individually customized.

Miscellaneous Filters is a set of user options that are not application specific.

Disable Beeps enables/disables the motion controller tones.

NOTE: SpaceNavigator does not produce tones.

Quicktap Enabled controls whether the QuickTaps functionality of the cap is on or off.

NOTE: SpaceMouse Plus/XT, Classic, CadMan, CyberMan and SpaceNavigator models only.

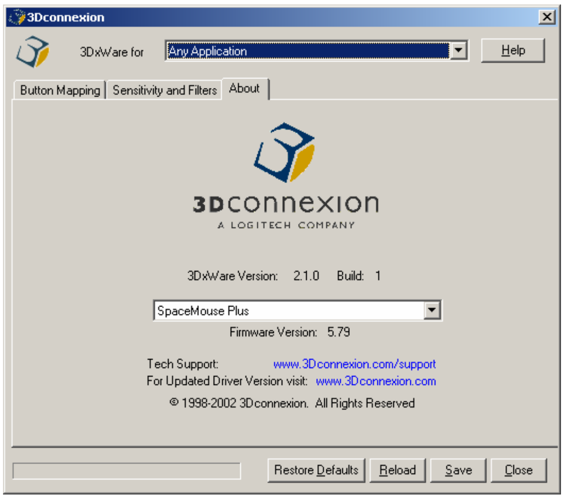
Disable LEDs enables/disables the lights on the SpaceMouse Plus XT and CadMan.

Linear Response controls the relationship between application response and the force applied to the motion controller. If selected, the response is linear. Otherwise a cubic non-linear curve is applied to the device data.

Note: This only affects the SpaceMouse, CadMan, CyberMan and SpaceNavigator models. The SpaceBall products produce a non-linear response directly in hardware.

About Tab

The About tab displays useful information including driver version, hardware firmware version, device models, and product and support websites. This information will be very useful should you need to contact 3Dconnexion support.



3DxWare for Any Application

3DxWare Version: 2.1.0 Build: 1

SpaceMouse Plus

Firmware Version: 5.79

Tech Support: www.3Dconnexion.com/support

For Updated Driver Version visit: www.3Dconnexion.com

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Drop-Down List allows for the selection of your particular device model. The 3DxWare driver will attempt to determine the model of the attached hardware device. If it cannot distinguish the model, the list will include all possible models for the device class. The model name matching the device in use should be chosen.

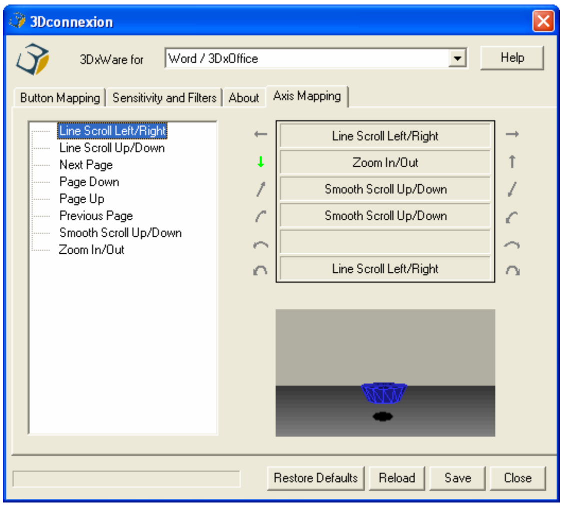
Note: Only one entry will exist in the drop-down list when 3DxWare identifies the attached device model.

Hyperlinks provide quick navigation to the 3Dconnexion website by selecting the website hyperlinks. These links load the 3Dconnexion home and support pages.

Axis Mapping Tab (3DxOffice Plug-in Only)

The Axis Mapping tab allows the user to drag and drop the motion controller's application features for mapping to the motion controller's directional movements.

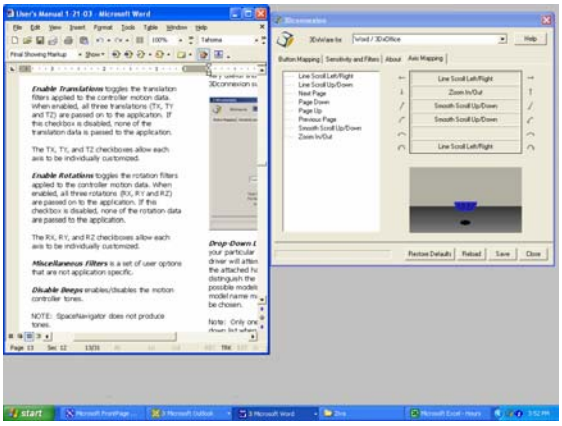
Each application is preconfigured with default settings for axis mapping. These default settings include standard operational motion for features such as scrolling and zooming.



The Axis Mapping tab also includes a helpful tool for gearing the relative movement of your motion controller. With the Axis Mapping tab open, move the motion controller toward you, away from you or pull up, down, shift left and right. As you move the motion controller, you will see the arrows on the tab light green, referring to the application specific motion and function. You will also observe the animation in the tab move directionally as you move the motion controller. This tool gives you the comfort and feel of your motion controller.

To use this tool to observe motion within a supported application, open the application and resize the window so that the application window and the control panel are side by side.

Ensure that the application window is active, the application is listed in the drop box at the top of the tab, and the Axis Mapping tab is open (as depicted in the picture below).



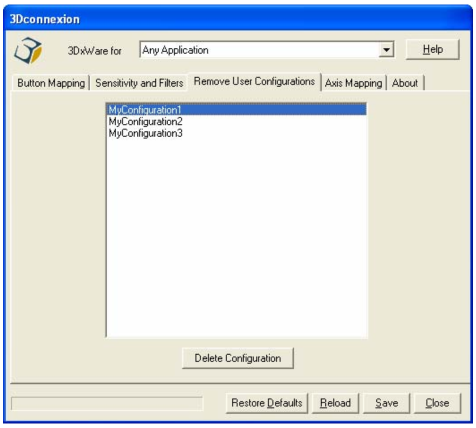
You can edit the functions mapped to the available motions by dragging and dropping from the function tree list. Expand the list to find the function you wish to map, and drag and drop the function to the appropriate motion. You may overwrite an existing feature by dragging and dropping over the previous choice, or, you may first unassign the function you wish to overwrite by right-clicking on the function and choosing Unassign.

You can also change the directional controller movement of a feature that offers opposite directions (i.e. scroll up/down, zoom in/out) by right clicking the function and choosing Swap Axis.

Note: The new mappings will not be saved to the configuration file until the user saves the current setup through the Global Controls interface.

Remove User Configurations

This tab allows you to allows you to manage the configurations you create for each supported application



Office Applications

The 3DxOffice plug-in establishes communication between the motion controller and several office productivity applications.

The 3DxOffice plug-in is set to install and configure by default when you first install the 3DxWare driver and SpaceNavigator. If you unchecked the 3DxOffice option upon install, you will need to reinstall and add the 3DxOffice option. If you need to install or reinstall the 3DxOffice plug-in, please review the driver installation for help on software installation.

In addition, the 3DxWare driver must be started in order for 3DxOffice to work properly. If set up correctly during installation, the driver should start automatically upon Windows login and the 3Dconnexion icon will appear in the system tray on the taskbar.

If the 3Dconnexion icon does not appear in the system tray, the 3DxWare driver may not be started or is stopped. The motion controller will have the same behavior as a "mousewheel" – the wheel that is located on your traditional mouse. The mousewheel behavior, when the 3DxWare driver is stopped or not started, will be available on the supported applications listed in this section, as well as non-supported applications.

If you need to restart the driver, you may do so from the Windows Start Menu by launching *Start > Programs > 3Dconnexion > 3DxWare > Start 3Dx > Start Driver.* For more information on driver installation and starting drivers, please refer to the section on driver installation.

The 3DxOffice plug-in for SpaceNavigator currently supports Microsoft® Office 2000 and XP Word, Excel, Outlook®, Outlook Express, PowerPoint®, Project, as well as Internet Explorer, and Windows® Explorer.

The following section will review features in each of the supported 3DxOffice applications supported by the SpaceNavigator.

Microsoft Word and Excel

SpaceNavigator Application Features

Using the motion controller, the SpaceNavigator allows you to:

- Zoom in and out within document without having to shift from current action
- Dynamically scroll and navigate document using the motion controller while editing the document with the traditional mouse
- Drag and drop text with the traditional mouse while scrolling document with the motion controller

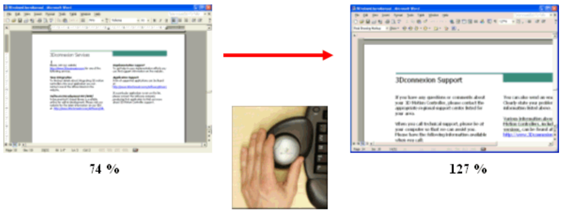
Note: All features described in this section are based on using preset or default settings for the motion controllers. Please review the section on the 3Dconnexion control panel for more information.

Microsoft Word

Zoom In/Zoom Out

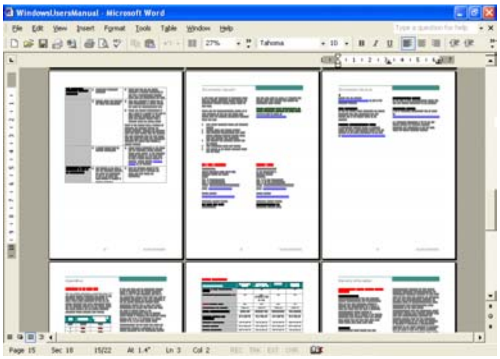
Using the motion controller, you can zoom in and zoom out of a Word document in the active window.

To zoom in on your Word document, push the motion controller puck straight down. To zoom out of your Word document, pull up on the motion controller puck, straight up. You can adjust the zoom incrementally by pulling up and pushing down on the controller accordingly for best viewing of the Word document. Pushing down or pulling up on the controller a greater amount will increase the speed of zoom.



Unlike the traditional mouse, the controller allows you to control the amount of zoom in and out incrementally and dynamically with a touch on the controller.

If you continue to zoom out on a multi-page document, Word will begin to display multiple pages of your document.


WindowsUsersManual - Microsoft Word
File Edit View Insert Format Tools Table Window Help
27%
Tahoma
10
Page 15 Sec 16 15/22 At 1.4" Ln 3 Col 2

To return from the multiple-page display to a page-by-page display, zoom in by pushing straight down on your motion controller. You can zoom in on your document up to 500 percent and zoom out down to 10 percent.

Scrolling

You can scroll up, down, right and left in Microsoft Word with your SpaceNavigator.

To scroll up and down, move the motion controller away from you and towards you without pulling up or rotating or twisting it. The motion controller puck should be moved in a straight linear motion.

To scroll left and right, move the motion controller puck right and left, without pushing forward or back or rotating or twisting the puck.

Drag and Drop

Drag and drop gives you the ability to highlight a piece of text in your document and move that text to another place in the document.

Simply highlight the text you wish to drag and drop with your traditional mouse. Click on the text using the left mouse button, and scroll with your motion controller using the motion described previously. Scroll to the location where the text is placed. Release the left button on your traditional mouse. The selected text will be dropped into this new location.

Using the controller to perform this action gives you better control over movement and accuracy versus using just the traditional mouse.

Microsoft Excel

The instructions for utilizing and moving the motion controller are similar to those described above for Microsoft Word. You will be using similar motion controller puck motions for zoom, scrolling, and drag and drop, but navigating in a spreadsheet rather than a word document.

Zoom In/Zoom Out

In an Excel spreadsheet, select a cell. Push straight down on the motion controller to zoom in. You will notice that the selected cell remains the focal point as you zoom in. Pull straight up on the motion controller to zoom back out.

You can zoom in on your spreadsheet up to 400 percent and zoom out up to 10 percent.

You can adjust the speed of zooming in and zooming out by adjusting the amount the motion controller puck is pushed down or pulled up. The greater amount of pushing down or pulling up will increase the zoom speed.

Scrolling

To scroll up and down the numbered rows on your Excel spreadsheet, move the motion controller away from you and towards you without pulling up or rotating or twisting.

To scroll left and right through the columns on your spreadsheet, move the motion controller right and left, again without pushing forward or back or rotating or twisting.

Note: The selected spreadsheet cell will remain selected throughout the scroll, even though you may have scrolled away from its visibility on the screen.

You can also use the scroll feature to highlight multiple cells. Select the first cell you wish to highlight using the left button on your traditional mouse. Holding the left mouse button, scroll up, down, right or left using the motion controller and release when you have finished highlighting the correct number of spreadsheet cells, rows or columns. You can adjust the area you wish to highlight by adjusting your motion controller incrementally during the scroll.

Drag and Drop

To drag and drop the contents of a spreadsheet cell or cells, select or highlight the cells that have content you wish to move to another location on your spreadsheet. Move your traditional mouse to the side of the cell or cells you've just selected until you see the "move" symbol. Click your left mouse button, holding it down while you scroll with the motion controller to the location where the cell contents will be placed. Release the left button on your traditional mouse.

Microsoft PowerPoint

Using similar motion controller puck movements as describe above, the SpaceNavigator can be used to navigate around your PowerPoint document.

Zoom In/Out

You can use the motion controller to zoom in and out of your PowerPoint presentation in Normal View, with or without outline pane activated, and in Slide Sorter View.

Normal View without the Outline Pane Activated

You can zoom in and out of a single slide using the push-down, pull-up motion described previously. You can zoom in up to 400 percent and zoom out up to 10 percent.

Normal View with the Outline Pane Activated

You will need to select either the slide presentation or the outline pane before you can zoom in/out on either area. To do so, move the traditional mouse in the area of either the slide presentation or the outline pane, and then zoom in or out using similar motion controller puck movements.

Slide Sorter View

To zoom in and out on the Slide Sorter View, first select that view in PowerPoint. Zoom in/out using the push down, pull up motion described previously.

Scrolling

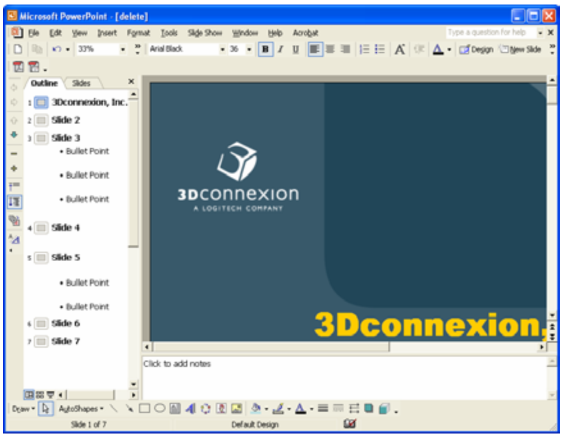
You can use the motion controller scroll function as described previously to scroll through your PowerPoint slide presentation as well as the outline pane in Normal View.

Normal View without the Outline Pane Activated

Use the up and down scroll function on your motion controller to page up and page down through your PowerPoint presentation.

You can use your motion controller to scroll up, down, left and right on a single PowerPoint slide if the slide is enlarged enough to activate a scroll bar on your screen. Use the zoom-in feature on your motion controller if you wish to enlarge in order to navigate within one slide.

Should you continue the motion of scrolling up or scrolling down on an enlarged slide, PowerPoint will page up and page down as you pass through the area of the current slide.



Normal View with Outline Pane Activated

You will need to select either the slide presentation or the outline pane before you can scroll on either area. To do so, move the traditional mouse in the area of either the slide presentation or the outline pane, and then scroll.

In order to scroll up and down in the outline pane, there must be sufficient slides in PowerPoint to activate a scroll bar. If there is no scroll bar present, then the PowerPoint presentation is small enough to display all slides in the outline and there is no need to scroll.

To scroll left and right in the outline pane, there also must be a left and right scroll bar present on the bottom of the pane. If there is not one present, then all contents are viewable left to right, and there is no need to scroll.

Microsoft Project

This section describes view-by-view how to utilize your motion controller in Microsoft Project.

Calendar View

In Calendar View, you can scroll up/down and left/right using the scrolling motions previously described.

To zoom in and zoom out, push straight down and pull straight up on the motion controller, as previously described. The zoom feature in Calendar View increases and decreases the size of the individual date cells on the calendar.

Gantt Chart and Task Usage Views

The Gantt Chart and Task Usage views are identical with regard to scrolling and zoom in/out features.

When you scroll in an up-and-down motion in the Gantt Chart and Task Usage views, both the task pane and the actual chart will scroll together.

When you scroll in a left-and-right motion, the task pane and the actual chart scroll separately. Choose the task pane or the chart to scroll left/right by moving the traditional mouse in the area of either of the views.

You can zoom in and out of the actual chart, but not in the task pane. An added benefit of zooming in on the actual chart is that time increments become more detailed as you zoom in and less incremental as you zoom out. For instance, you can zoom in from a view of specified years incremented by quarters to a view of specified years incremented by twelve months simply by pushing down on the motion controller. Or, you can zoom out from a view of specified weeks incremented by days to a view of specified months incremented by weeks.

You can continue to zoom in until you arrive at a view of single dates with timescale, or zoom out until you arrive at a view of specified years incremented by first half and second half. When you open a new project file, the default setting is "week of" dates, incremented by days of the week.

Follow these same instructions for the Tracking Gantt View.

Resource Sheet and Resource Usage Views

In the Resource Sheet View, you can scroll up/down and left/right as previously described. There is no zoom in this view.

The Resource Usage View uses the same scrolling and zooming instructions as the Gantt Chart and Task Usage Views. Please review that section for details.

Microsoft Outlook and Outlook Express

Your motion controller has the capability of scrolling up/down and left/right within mail folders in Microsoft Outlook and Outlook Express. You may also zoom in/out in Microsoft Outlook email message texts that have Microsoft Word set as the editor.

Scrolling

You can scroll in either the mailbox or in the folder list. Make sure that you have moved the mouse over either the mailbox or the folder list before you attempt to scroll.

In order to scroll up and down, there must be sufficient entries in that window in order to create the need to scroll. Otherwise, all entries will be viewable on the screen and you will not need to scroll.

To scroll left and right, there also must be a left and right scrollbar present on the bottom of the pane, indicating that there is more text not currently available on screen. If there is no scrollbar present, then all contents are viewable left to right, and there is no need to scroll.

Zoom In/Out

In Outlook, you may zoom in and out within email message texts with these characteristics:

1. Email message is in an "edit" mode, which includes emails you are in the action of:
    a. Composing
    b. Replying to
    c. Forwarding to
2. You have "Use Microsoft Word to edit email messages" set in your Outlook Options → Mail Format tab. See Microsoft Outlook Help if you have questions regarding this setting.

If Outlook is not configured as described above, you will not be able to zoom in/out on your email documents. Zoom in and out is not currently available in Outlook Express.

Windows Explorer and Internet Explorer

Your SpaceNavigator motion controller also contains added features for navigating in Windows Explorer and Internet Explorer.

Windows Explorer

Your motion controller has the capability of scrolling up/down and left/right within folders in Windows Explorer, as well as dragging and dropping folders to new locations.

Scrolling

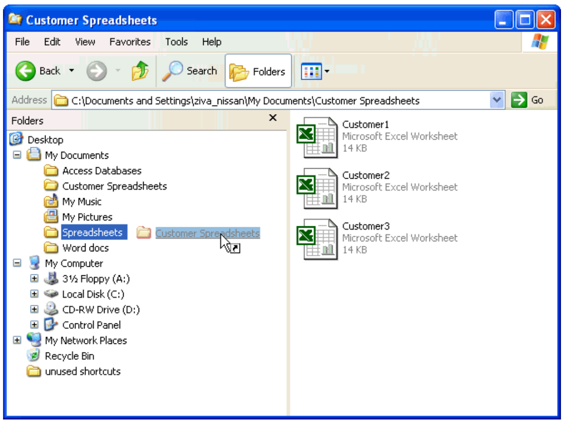
You can scroll in either the folder list or the folder content list. Make sure that you have selected the list you wish to work with before you begin scrolling.

In order to scroll up and down, there must be sufficient entries in that window in order to create the need to scroll. Otherwise, all entries will be viewable on the screen and you will not need to scroll.

To scroll left and right, there also must be a left and right scrollbar present on the bottom of the pane, indicating that there is more text not currently available on screen. If there is no scrollbar present, then all contents are viewable left to right, and there is no need to scroll.

Drag and Drop Folders or Files

You can also use scrolling to move folders or files to new locations in the Windows Explorer folder tree.


Address C:\Documents and Settings\ziva_nissan\My Documents\Customer Spreadsheets

To move a folder or a file to a new location using the motion controller, first select the folder or file you wish to move using your traditional mouse. While holding down the left mouse button, scroll using motion controller puck movements to the location where the folder or file will be placed. Upon reaching the new location, release the left button on your traditional mouse and your folder or file will be placed in the new directory.

Internet Explorer

You can use your SpaceNavigator to scroll within your Internet Explorer browser.

After accessing the web page you would like to view, make sure the active window of your browser is selected. Scroll up/down or left/right using the motion described earlier.

As described in previous sections, there must be web page text beyond the immediate window view in order to create the need for scrolling up/down or left/right.

3DxOffice Supported Applications and Functions

Office Applications	Functions Available	
	Default	**Optional**
Word	Scroll, Zoom	Page Up/Down, Next/Previous Page
Excel	Scroll, Zoom	Page Up/Down, Page Left/Right, Next/Previous Sheet
Outlook®	Scroll, Zoom	Page Up/Down, Next/Previous Item, Zoom Calendar In/Out
Outlook Express	Scroll	Page Up/Down
PowerPoint®	Scroll, Zoom	Page Up/Down
Project	Scroll, Zoom	Page Up/Down
Internet Explorer	Scroll	Page Up/Down, History Back/Forward, Zoom
Windows® Explorer	Scroll	Page Up/Down, History Back/Forward

Troubleshooting

Problem/Error	***Possible Explanations***	***Recommended Actions***
The device is not working in my application.	➢ 3DxWare is not properly installed or running.	✓ Re-install 3DxWare and verify that the demos distributed with the driver operate.
	➢ The motion controller is not enabled or working properly within the application.	✓ Ensure that the appropriate add-in is installed from the CDROM or 3Dconnexion website. ✓ Some applications require that the device be explicitly enabled for operation. Please consult the application or add-in documentation for instructions.
	➢ Both the translation and rotation are turned off.	✓ Activate the translation and/or rotation. Verify these settings in both the 3DxWare interface and the application.
	➢ The device sensitivity has been set too low for visible motion to occur.	✓ Check to see that the sensitivity level of the device is adjusted correctly.
	➢ The application is not in a graphical mode that supports 3D input devices.	✓ Reference the application vendor's documentation to make sure it is in a compatible 3D mode.
	➢ The application contains a suitable driver and therefore does not need 3DxWare running.	✓ Use the Start Menu to shutdown the 3DxWare driver.
The motion controller does not beep. *(Not applicable for SpaceNavigator, which does not beep.)*	➢ The 3DxWare driver is not installed or configured to run from the Startup folder.	✓ Check at http://www.3Dconnexion.com to confirm that you have the latest driver and plug-in. ✓ Reinstall the driver.
	➢ Communication port may not be enabled.	✓ Confirm that the serial port is properly configured in the Device Manager or for Windows NT 4.0: Control Panel -> Ports.
	➢ No beep may indicate a failing communication port or poor connection.	✓ Check power and cable connections.

"The 3DxWare driver is already running"	➢ The driver has already been loaded.	✓ When operational, the 3DxWare driver icon will exist in the System Tray. The driver will load automatically when the user logs into the system or when a supported application is started. If you feel you are getting this message in error, please contact Technical Support.
"No motion controller Could Be Detected"	➢ Improperly connected hardware.	✓ Make sure that the motion controller is properly connected. If you use a 9-pin-to-25-pin adapter, make sure the connections are tight.
	➢ Another driver has claimed the serial port resources.	✓ Use Task Manager to verify that no other applications or device drivers are using the communication port. ✓ Check the system configuration to see if there is a conflict in the IRQ or base address between the serial ports and another device (e.g. a modem) using the control panel. Note: If you suspect such a conflict, try rebooting the machine without the device attached. Reattach the controller once you have logged onto the machine and start 3DxWare from the Start Menu. This will keep any driver that mistakenly identifies the device from loading at system boot-up.
	➢ A power supply may be needed. (SpaceBall)	✓ When power is supplied to the serial port the SpaceBall should produce clean, sharp beeps. If the SpaceBall warbles, chirps, or if the tone falls off then a power supply adapter is needed. Please contact Technical Support for an adapter.
Cannot find (or start) the driver or one of its components.	➢ The system is not able to find the 3DxWare because the driver file 3dxsrv.exe or one of its DLLs has been deleted or moved to another directory.	✓ Use the uninstall option of the installation tool to uninstall the driver and then re-run the installation.

3Dconnexion Support

If you have any questions or comments about your motion controller, please contact the appropriate regional support center listed for your area.

When you call technical support, please be at your computer so that we may best assist you. Please have the following information available when you call:

- Your name, company name, and telephone number
- Product name and version number
- Your computer configuration: CPU type, speed, memory, pointing device, video card (its memory and resolution)
- The platform and operating system you are running
- Your application name and version
- The version of motion controller driver you are using

You can also send an email or a detailed fax. Clearly state your problem and include the information listed above.

Information on 3Dconnexion's motion controllers, including the latest driver versions, can be found at:
http://www.3Dconnexion.com

US / Asia / Americas

3Dconnexion
100 Knowles Drive
Los Gatos, CA 95032
Web: www.3Dconnexion.com

Online Support
http://www.3dconnexion.com/support.htm

Email a Technical Support Request
http://www.3dconnexion.com/contactsupport.htm

Technical Support Hotline
+1 (800) 732-5079
(English Only)

Europe / EMEA

3Dconnexion GmbH
An der Hartmuehle 8
D-82229 Seefeld
3Dconnexion GmbH
An der Hartmuehle 8
82229 Seefeld, Germany
Web: www.3Dconnexion.com

Online Support
http://www.3dconnexion.com/support.htm

Email a Technical Support Request
http://www.3dconnexion.com/contactsupport.htm

Technical Support Hotline
+49 (8152) 9919 44
(English & German Only)

3Dconnexion Services

Please visit our website http://www.3Dconnexion.com for any of the following services.

New Integration
To find out details about integrating motion controllers into your application you can contact one of the offices listed on the website.

Software Development Kit (SDK)
A documented C-based library is available online for add-in development. Please visit our website for the latest information on our SDK at: http://www.3Dconnexion.com/software/sdk

Implementation support
To get help in your implementation efforts you can find support information on the website.

Application Support
A list of supported applications can be found on our website. If a particular application is not on the list, please contact the software company producing that application to find out more about motion controller support.

Connecting to the Serial Port

The motion controller for serial port connection is equipped with a 9-pin D-Sub female connector. The wiring of this connector matches any IBM-compatible PC with a 9-pin serial connector. To use the motion controller with other computers, check the pin functions against the list shown below and verify whether the motion controller connector wiring matches your system.

Pin	Meaning	Connection to Computer
Case	Shield	Case
2	TxD	RxD
3	RxD	TxD
4	Supply	DTR
5	GND	GND
7	CTS	RTS
8	RTS	CTS

If not, you must use an appropriate adapter cable to connect the motion controller wiring to that of your computer. The use of the handshake signals (CTS, DTR and RTS) is absolutely necessary for the safe operation of the motion controller. Without these handshake signals, loss of data will occur. Additionally, the signal lines (DTR and RTS) are used to supply power to the 3Dconnexion device. Therefore, no external power supply is required. The minimum output voltage has to be 5 V, providing an output current of 10 mA on both signal lines.

Communication via the serial port using the XON/XOFF protocol is supported by the motion controller, but the handshake signals (CTS, DTR and RTS) are needed for safe operation. Therefore, the status of the handshake signals has to be carefully checked and treated by the computer. To activate the motion controller, these signals should have a positive (active) level.

Product Specifications

Feature/Specification	SpaceMouse Classic	SpaceMouse Plus & Plus XT	CadMan	SpaceBall 4000FLX	SpaceNavigator
Number of freely programmable buttons	9	11	4	12	40 (through the keyboard)
Software-controllable keyboard LEDs	No	Yes (2 yellow, 1 red) XT Only	No	No	No
QuickTap virtual button	Yes	Yes	Yes	No	Yes
Device weight (for stability)	0.660 kg	0.680 kg	0.680 kg	0.650 kg	0.620 kg
Operating humidity (non-condensing)	10 to 98% RH	10 to 98% RH	10 to 98% RH	10 to 98% RH	10 to 98% RH
Operating temperature	+5 to +60 °C	+5 to +60 °C	+5 to +60 °C	+10 to +40 °C	+5 to +60 °C
Storage humidity	10 to 98% RH	10 to 98% RH	10 to 98% RH	10 to 98% RH	10 to 98% RH
Storage temperature	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	+6 to +60 °C	-40 to +85 °C
Supported systems	*UNIX:* DEC, HP, IBM, SGI, SUN, Linux *PC:* Win98, ME, WinNT, 2000, XP	*UNIX:* DEC, HP, IBM, SGI, SUN, Linux *PC:* Win98, ME, WinNT, 2000, XP	*UNIX:* DEC, HP, IBM, SGI, SUN, Linux *PC:* Win98, ME, WinNT, 2000, XP	*UNIX:* DEC, HP, IBM, SGI, SUN, Linux *PC:* Win98, ME, WinNT, 2000, XP	*PC:* 2000, XP
Power source	5V / 9mA	5V / 9mA	5V / 9mA	5V / 10mA	5V / 75mA
Connector	Serial or USB	Serial or USB	Serial or USB	Serial or USB	USB
Baud Rate	9600 Baud	9600 Baud	9600 Baud	9600 Baud	USB
Standard Data Rate	40 ms	40 ms	40 ms	50 ms	20 ms
Compact Size L x W x H (mm)	165 x 112 x 40	188 x 129 x 44	175 x 122 x 43	213 x 152 x 76	560x230x42
FCC, TUV/GS, VCCI, CSA or UL, & CE - Approved	Yes	Yes	Yes	Yes	Yes
Length of manufacturer's warranty	3 years	3 years	3 years	3 years	3 years
Unix Specific Features					
Dialbox Simulation	Yes	Yes	Yes	Yes	N/A
LPFK Simulation	Yes	Yes	Yes	Yes	N/A
Dominant Mode	Yes	Yes	Yes	Yes	N/A

Product Specifications
Please visit our website to see additional information on our complete line of motion controllers at: http://www.3dconnexion.com/products.

FCC Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1) This device may not cause harmful interference.
2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

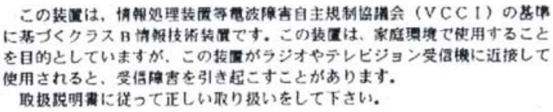
CAUTION: The user is cautioned that changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

European Economic Community Declaration of Conformance (CE)

The Magellan/SPACE MOUSE is attested to meet the essential protection requirements against electromagnetic emission, which are established in the regulations of the council for assimilating the rules and regulations of the member states about electromagnetic compatibility 89/336/EEC and changed by regulation 92/31 EEC. This declaration is valid for all samples produced according to the enclosed production drawings, which are part of this declaration. The following standards were used for judging the product concerning electromagnetic capability:

- For trouble emission: EN55022 edition: 05/95
- For trouble security: EN50082-1 edition: 03/93

VCCI Class B Declaration



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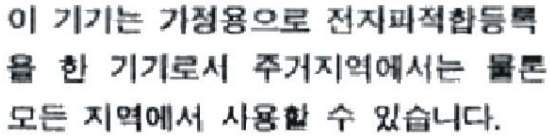
取扱説明書に従って正しい取り扱いをして下さい。

Korea Class B Declaration



이 기기는 가정용으로 전자파적합등록을 한 기기로서 주거지역에서는 물론 모든 지역에서 사용할 수 있습니다.

Warranty Information

3Dconnexion's Limited Lifetime Product Warranty

Limited Warranty

3Dconnexion warrants that any hardware product accompanying this documentation shall be free from significant defects in material and workmanship for a period of three (3) years from the date of purchase. 3Dconnexion's limited warranty is nontransferable and is limited to the original purchaser. This warranty gives you specific legal rights, and you may also have other rights which vary under local laws.

Remedies

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